



SGI® DataRaptor™ Appliance with MarkLogic® Database

Quick Start Guide

007-5907-001

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## Record of Revision

Version	Description
001	January 2013 Initial printing.



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## About This Guide

This guide provides an overview of the SGI® DataRaptor™ with MarkLogic® Database appliance along with getting-started instructions. This guide consists of the following chapters:

- [Chapter 1, “Overview,”](#) provides an overview of the SGI DataRaptor appliance.
- [Chapter 2, “Cluster Startup,”](#) describes configuration requirements for cluster management and monitoring, getting-started instructions, and licensing.
- [Chapter 3, “MarkLogic Usage Notes,”](#) provides licensing and validation database information as well as a pointer to SGI Knowledgebase.

## Audience

This guide is written for the system administrators of the DataRaptor appliance and developers. The guide assumes the reader is familiar with clusters and Big Data technology.

## Related Publications

The following SGI documents are relevant to your SGI DataRaptor appliance:

- *SGI Management Center Quick Start Guide* (007-5672-xxx)
- *SGI Management Center (SMC) Installation and Configuration* (007-5643-xxx)
- *SGI Management Center (SMC) System Administrator's Guide* (007-5642-xxx)
- *SGI Rackable RP2 Standard-Depth Servers User Guide* (007-5837-xxx)
- *SGI Rackable C1110-RP6 System User Guide* (007-5843-xxx)

You can obtain SGI documentation in the following ways:

- Refer to the SGI Technical Publications Library (TPL) at <http://docs.sgi.com>. Various formats are available. The TPL contains the most recent and most comprehensive set of online books, man pages, and other information.

To get the latest revision of a document on the TPL, use the core publication number as your search string. For example, use 007-1234 as your search string to get the latest version of the document with part number 007-1234-xxx.

- Refer to the SGI Supportfolio™ webpage for documents whose access require a support contract. See “[Product Support](#)” on page ix.
- You can also view man pages by typing `man <title>` on a command line.

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**Note:** For information about third-party system components, see the documentation provided by the manufacturer/supplier.

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## Product Support

SGI provides a comprehensive product support and maintenance program for its products. SGI also offers services to implement and integrate Linux applications in your environment.

- Refer to <http://www.sgi.com/support/>
- If you are in North America, contact the Technical Assistance Center at +1 800 800 4SGI or contact your authorized service provider.
- If you are outside North America, contact the SGI subsidiary or authorized distributor in your country.

Be sure to have the following information before you call Technical Support:

- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

## Reader Comments

If you have comments about the technical accuracy, content, or organization of this document, contact SGI. Be sure to include the title and document number of the manual with your comments. (Online, the document number is located in the front matter of the manual. In printed manuals, the document number is located at the bottom of each page.)

You can contact SGI in any of the following ways:

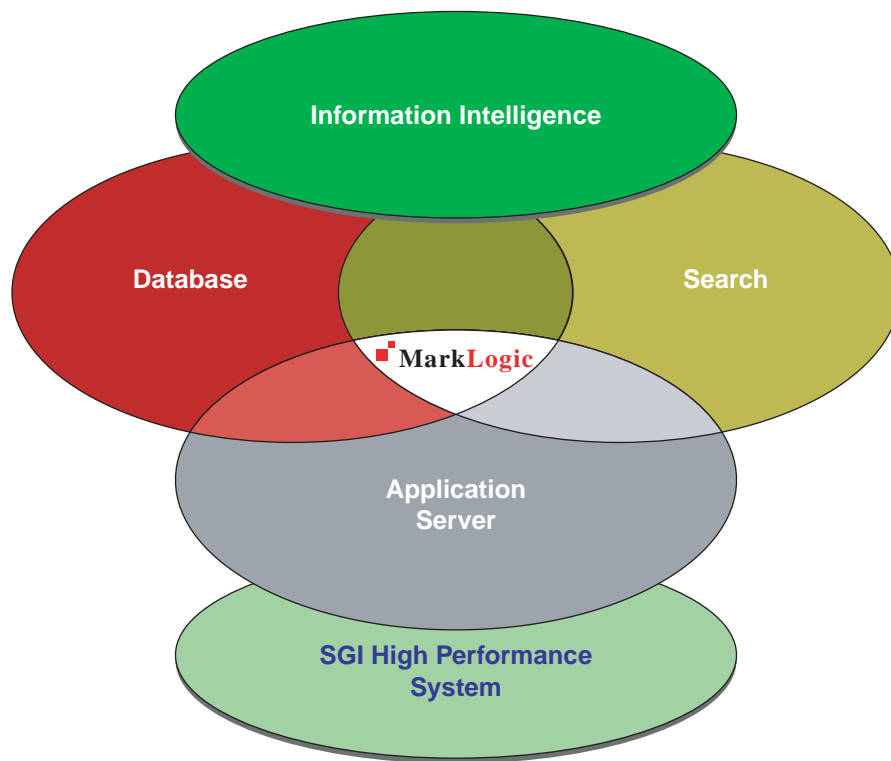
- Send e-mail to the following address: [techpubs@sgi.com](mailto:techpubs@sgi.com)
- Contact your customer service representative and ask that an incident be filed in the SGI incident tracking system.
- Send mail to the following address:

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SGI values your comments and will respond to them promptly.

## Overview

As illustrated in [Figure 1-1](#), the SGI DataRaptor with MarkLogic Database appliance provides a content management platform for Information Intelligence.



**Figure 1-1** SGI DataRaptor with MarkLogic Database—Solution Stack

The appliance has the following features:

- Two appliance models:
  - SGI DataRaptor High-Performance Appliance
  - SGI DataRaptor High-Capacity Appliance
- Includes a MarkLogic NoSQL validation database.
- Delivered factory-integrated and ready-to-run
- Choice of four densely-packed rack configurations for each model:
  - One-Fourth Rack
  - Half-Rack
  - Full-Rack
  - Multi-Rack
- Ability for application developers (end users or ISVs) to test drive and then reconfigure the database per their application needs
- Can accommodate best practices and tunables for any database reconfigurations needed for user applications.

This overview describes the following components:

- “Hardware” on page 3
- “Rack Configurations” on page 6
- “Network Topology” on page 12
- “Software” on page 16

## Hardware

This section describes the hardware used in the two SGI DataRaptor appliance models: first, the servers and then the network hardware.

### Servers

This section describes the SGI servers that are used in the SGI DataRaptor appliance, their function in the appliance, and their specifications.

The SGI High-Performance Appliance model employs the SGI Rackable™ ISS3124-RP2 server shown in [Figure 1-2](#).



**Figure 1-2** ISS3124-RP2 Server—High-Performance Appliance Model

The SGI High-Capacity Appliance model employs the SGI Rackable ISS3112-RP2 server shown in [Figure 1-3](#).



**Figure 1-3** ISS3112-RP2 Server—High-Capacity Appliance Model

Table 1-1 describes the specifications of the servers in the high-performance model based on the Intel® Xeon® Processor E5-2600 Series.

**Table 1-1** Server Specifications for the High-Performance Appliance

SGI Server	Node Function	Specifications
ISS3124-RP2	Database Node	<ul style="list-style-type: none"> <li>- 2U full-depth chassis</li> <li>- 20x2.5" 900GB 10K rpm SAS drives in RAID 10 configuration</li> <li>- 4x100GB enterprise-class flash SSDs in RAID 10 configuration</li> <li>- Separate 80GB SSD for OS drive</li> <li>- Intel Xeon Processors E5-2680 (2.7GHz eight-core)</li> <li>- 16x 8GB 1.5v 1600 MHz DIMMs (128GB Memory)</li> <li>- Dual-port 10GigE</li> </ul>
C1110-RP6	SGI Management Center Node (Admin Node)	<ul style="list-style-type: none"> <li>- 1U full-depth chassis with 4x3.5" 1TB 7.2K rpm SATA drives in RAID 10 configuration</li> <li>- Intel Xeon Processors E5-2650 (2.0GHz eight-core)</li> <li>- 8x 4GB 1.5v 1600 MHz DIMMs (32GB Memory)</li> <li>- 3x GigE ports</li> <li>- Redundant power supply</li> </ul>

Table 1-2 describes the specifications of the servers in the high-capacity model based on the Intel Xeon Processor E5-2600 Series.

**Table 1-2** Server Specifications for the High-Capacity Appliance

SGI Server	Node Function	Specifications
ISS3112-RP2	Database Node	<ul style="list-style-type: none"> <li>- 2U full-depth chassis</li> <li>- 10x3.5" 3TB 7.2K rpm SAS drives RAID 6 configuration</li> <li>- 2x200GB enterprise-class flash SSDs in RAID 1 configuration</li> <li>- Separate 80GB SSD for OS drive</li> <li>- Intel Xeon Processors E5-2680 (2.7GHz eight-core)</li> <li>- 16x 8GB 1.5v 1600 MHz DIMMs (128GB Memory)</li> <li>- Dual-port 10GigE</li> </ul>
C1110-RP6	SGI Management Center Node (Admin Node)	<ul style="list-style-type: none"> <li>- 1U full-depth chassis with 4x3.5" 1TB 7.2K rpm SATA drives in RAID 10 configuration</li> <li>- Intel Xeon Processors E5-2650 (2.0GHz eight-core)</li> <li>- 8x 4GB 1.5v 1600 MHz DIMMs (32GB Memory)</li> <li>- 3x GigE ports</li> <li>- Redundant power supply</li> </ul>

## Network Hardware

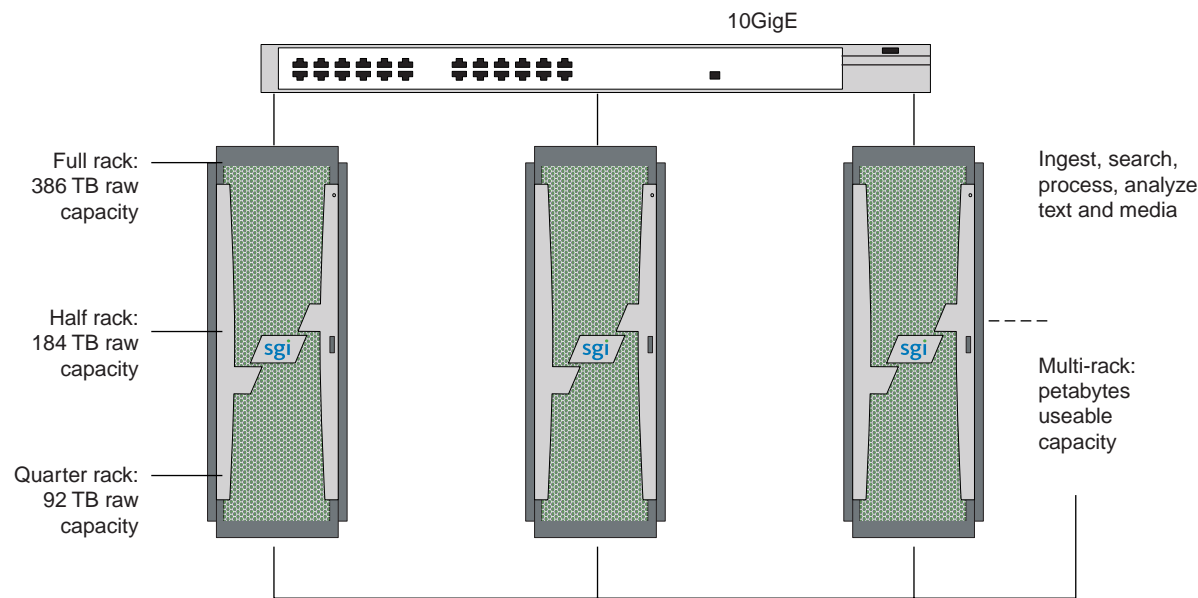
The following network hardware components are used in rack configurations:

- 2x 48-port 10-GigE data network switches
- 1x 48-port GigE switch for SGI Management Center network
- 2x 48-port 10-GigE spine switches with the first rack of multi-rack configurations only

# Rack Configurations

The high-performance and high-capacity appliance models are available in single-rack and multi-rack configurations. This section describes the quarter-rack, half-rack, full-rack, and multi-rack configurations for both models.

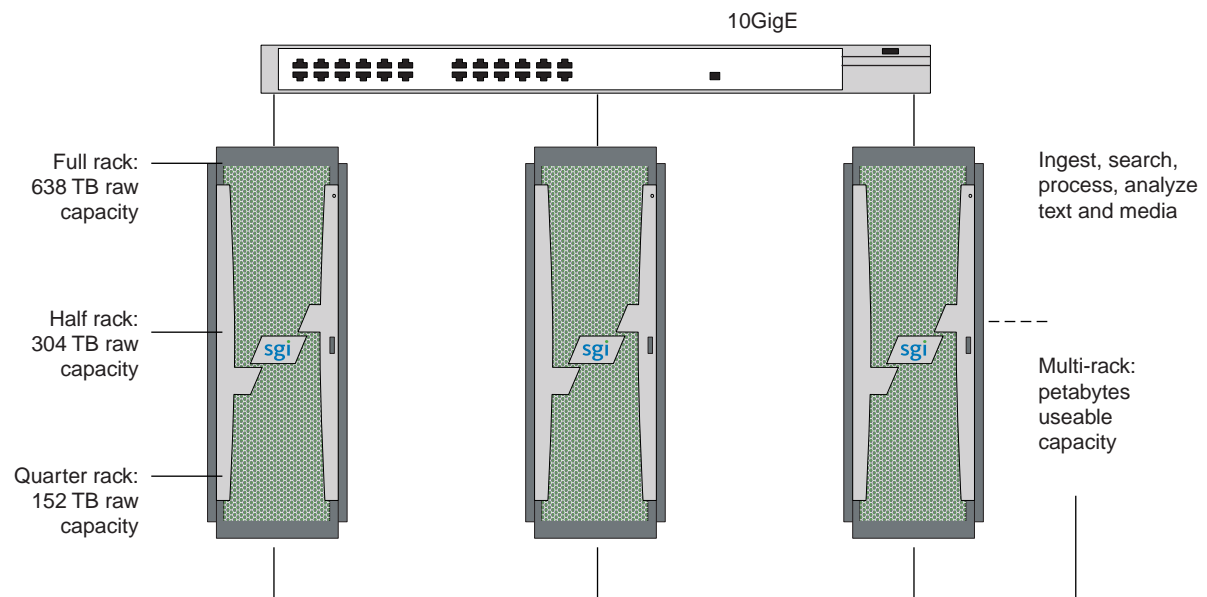
Figure 1-4 shows the range of data capacity for high-performance configurations.



**Figure 1-4** Data Capacity for Various High-Performance Rack Configurations



Figure 1-5 shows the range of data capacity for high-capacity configurations.



**Figure 1-5** Data Capacity for Various High-Capacity Rack Configurations

**Note:** The following configurations shown in this section are for the high-performance appliance models. In each case, there is a similar configuration for the high-capacity appliance model.

Quarter-Rack




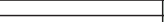






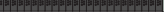





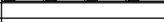















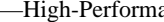

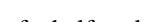

Destination Rack		RackU
Description	Image	
48port GigE SGI MC Management Switch		46
48port 10GigE Data Network Switch		45
48port 10GigE Data Network Switch		44
Admin Node/SGI MC Node		43
		42
		41
		40
		39
		38
		37
		36
		35
		34
		33
		32
		31
		30
		29
		28
		27
		26
		25
		24
		23
		22
		21
		20
		19
		18
		17
		16
		15
		14
		13
		12
		11
		10
Database Node		9
Database Node		8
Database Node		7
Database Node		6
Database Node		5
Database Node		4
Database Node		3
Database Node		2
Database Node		1

Figure 1-6 Quarter-Rack Configuration—High-Performance Appliance

Figure 1-6 describes the configuration of a quarter-rack configuration for a high-performance appliance. The rack consists of the following:

- One SGI Management Center node
- Five database nodes
- Two 48-port, 10-GigE data network switches
- One SGI Management Center network switch

## Half-Rack

Destination Rack		RackU
Description	Image	
48port GigE SGI MC Management Switch		46
48port 10GigE Data Network Switch		45
48port 10GigE Data Network Switch		44
Admin Node/SGI MC Node		43
		42
		41
		40
		39
		38
		37
		36
		35
		34
		33
		32
		31
		30
		29
		28
		27
		26
		25
		24
		23
		22
		21
		20
Database Node		19
Database Node		18
Database Node		17
Database Node		16
Database Node		15
Database Node		14
Database Node		13
Database Node		12
Database Node		11
Database Node		10
Database Node		9
Database Node		8
Database Node		7
Database Node		6
Database Node		5
Database Node		4
Database Node		3
Database Node		2
Database Node		1

**Figure 1-7** Half-Rack Configuration—High-Performance Appliance

Figure 1-7 describes the configuration of a half-rack configuration for a high-performance appliance. The rack consists of the following:

- One SGI Management Center node
- 10 Database nodes
- Two 48-port, 10-GigE data network switches
- One SGI Management Center network switch
- Two 48-port, 10-GigE data network switches

Full-Rack (46U)
















































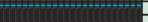



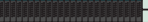



Destination Rack		RackU
Description	Image	
48port GigE SGI MC Management Switch		46
48port 10GigE Data Network Switch		45
48port 10GigE Data Network Switch		44
Admin Node/SGI MC Node		43
		42
Database Node		41
		40
Database Node		39
		38
Database Node		37
		36
Database Node		35
		34
Database Node		33
		32
Database Node		31
		30
Database Node		29
		28
Database Node		27
		26
Database Node		25
		24
Database Node		23
		22
Database Node		21
		20
Database Node		19
		18
Database Node		17
		16
Database Node		15
		14
Database Node		13
		12
Database Node		11
		10
Database Node		9
		8
Database Node		7
		6
Database Node		5
		4
Database Node		3
		2
Database Node		1

Figure 1-8 Full-Rack Configuration—High-Performance Appliance

Figure 1-8 describes the configuration of a full-rack configuration for a high-performance appliance. The rack consists of the following:

- One SGI Management Center node
- 21 Database nodes
- Two 48-port, 10-GigE data network switches
- One SGI Management Center network switch

## Multi-Rack

Destination Rack	Image	RackU	Destination Rack	Image	RackU
48port 10GigE Data Network Switch		48	48port GigE SGI MC Management Switch		46
48port 10GigE Data Network Switch		47	48port 10GigE Data Network Switch		45
48port GigE SGI MC Management Switch		46	48port 10GigE Data Network Switch		44
48port 10GigE Data Network Switch		45			43
48port 10GigE Data Network Switch		44			42
Admin Node/SGI MC Node		43			41
		42			40
Database Node		41			39
		40			38
Database Node		39			37
		38			36
Database Node		37			35
		36			34
Database Node		35			33
		34			32
Database Node		33			31
		32			30
Database Node		31			29
		30			28
Database Node		29			27
		28			26
Database Node		27			25
		26			24
Database Node		25			23
		24			22
Database Node		23			21
		22			20
Database Node		21			19
		20			18
Database Node		19			17
		18			16
Database Node		17			15
		16			14
Database Node		15			13
		14			12
Database Node		13			11
		12			10
Database Node		11			9
		10			8
Database Node		9			7
		8			6
Database Node		7			5
		6			4
Database Node		5			3
		4			2
Database Node		3			1
		2			1
Database Node		1			1

**Figure 1-9** Multi-Rack (First Rack, Second Rack, and beyond)—High-Performance Appliance

Figure 1-9 describes the configuration of a multi-rack configuration for a high-performance appliance. The first rack of a multi-rack configuration consists of the following:

- One SGI Management Center node
- 21 Database nodes
- Two 48-port, 10-GigE data network switches
- One SGI Management Center network switch
- Two 48-port, 10-GigE data spine switches

The second rack (and subsequent racks) of a multi-rack configuration consists of the following:

- 21 Database nodes
- Two 48-port, 10-GigE data network switches
- One SGI Management Center network switch

## Network Topology

The section illustrates the network topology from the most granular level (node level) to the top level (inter-rack level):

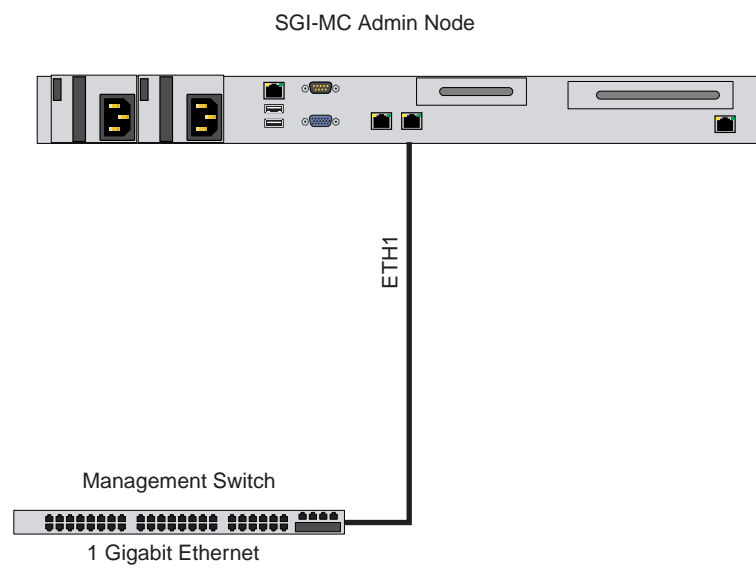
- [“Node Level” on page 13](#)
- [“Rack Level for Single-Rack Configuration” on page 15](#)
- [“Inter-Rack Level” on page 16](#)

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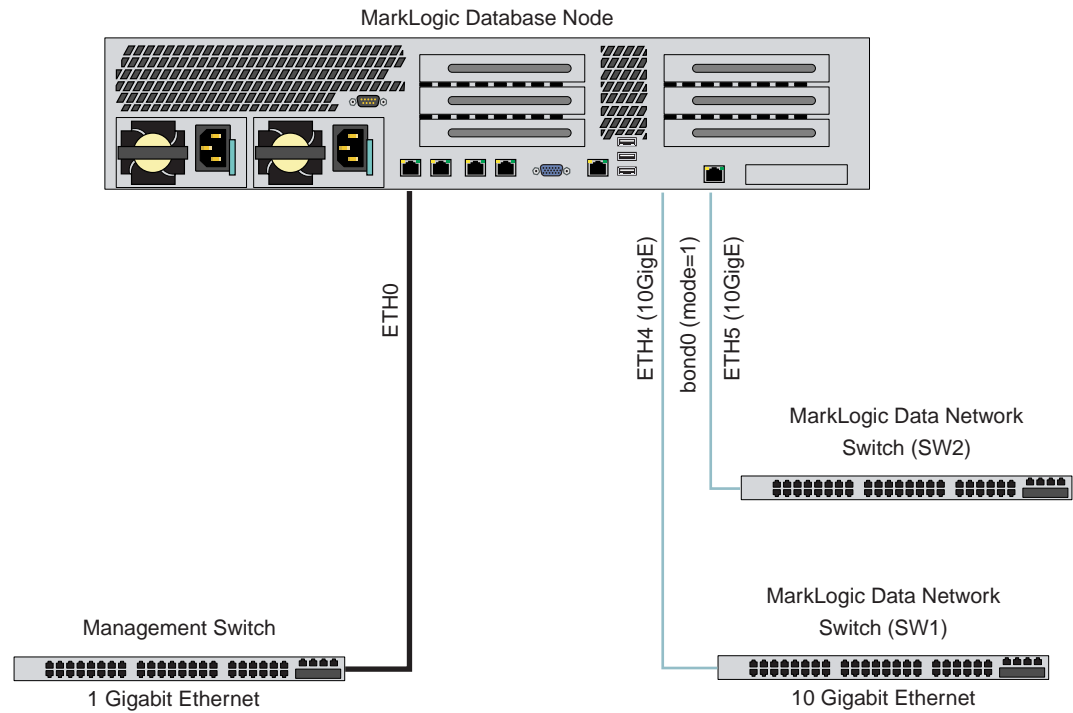
**Note:** The network topology described in this section applies to both the high-performance and high-capacity models of the appliance.

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## Node Level



**Figure 1-10** Network Topology (Node Level)—SGI Administration Node

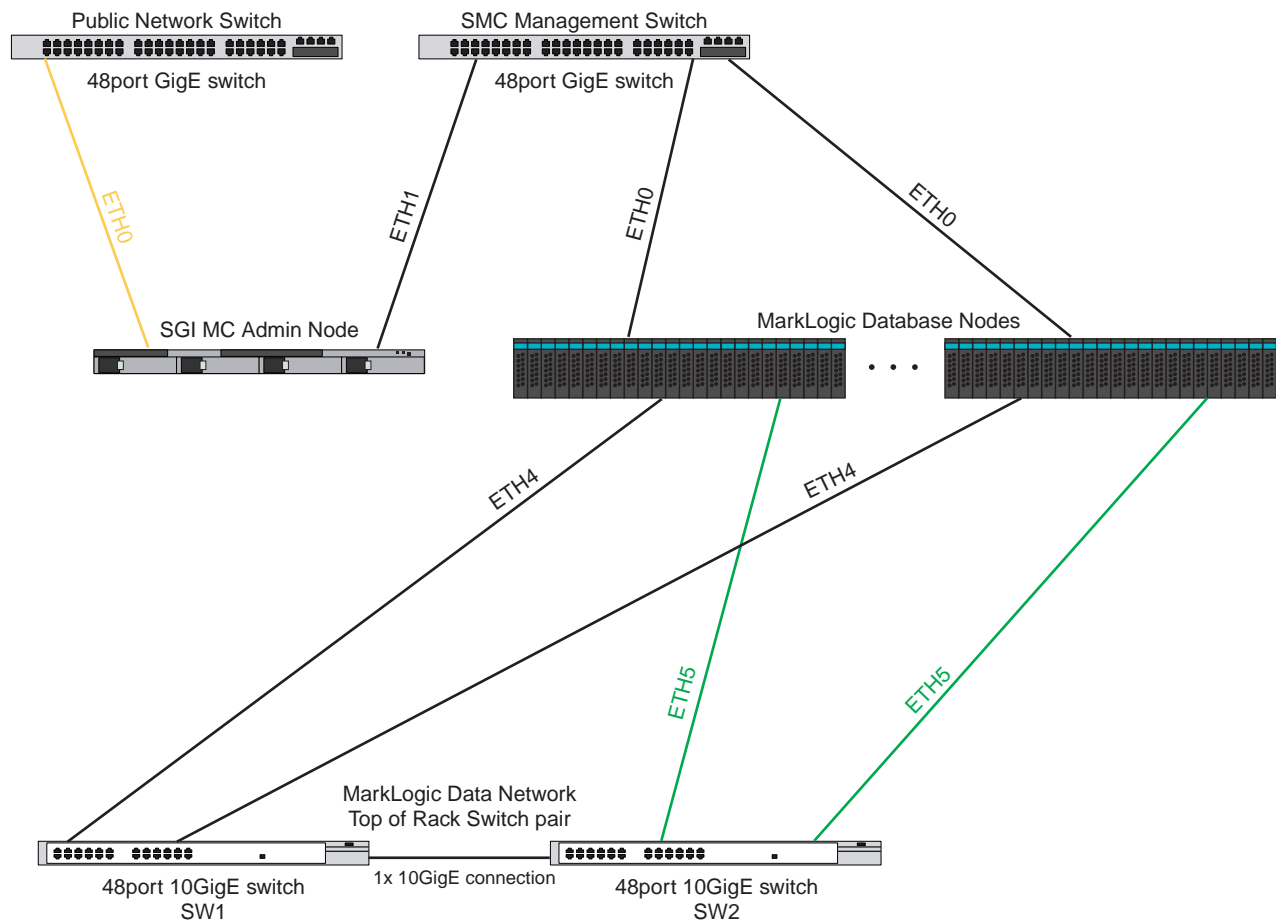


**Figure 1-11** Network Topology (Node Level)—Database Server



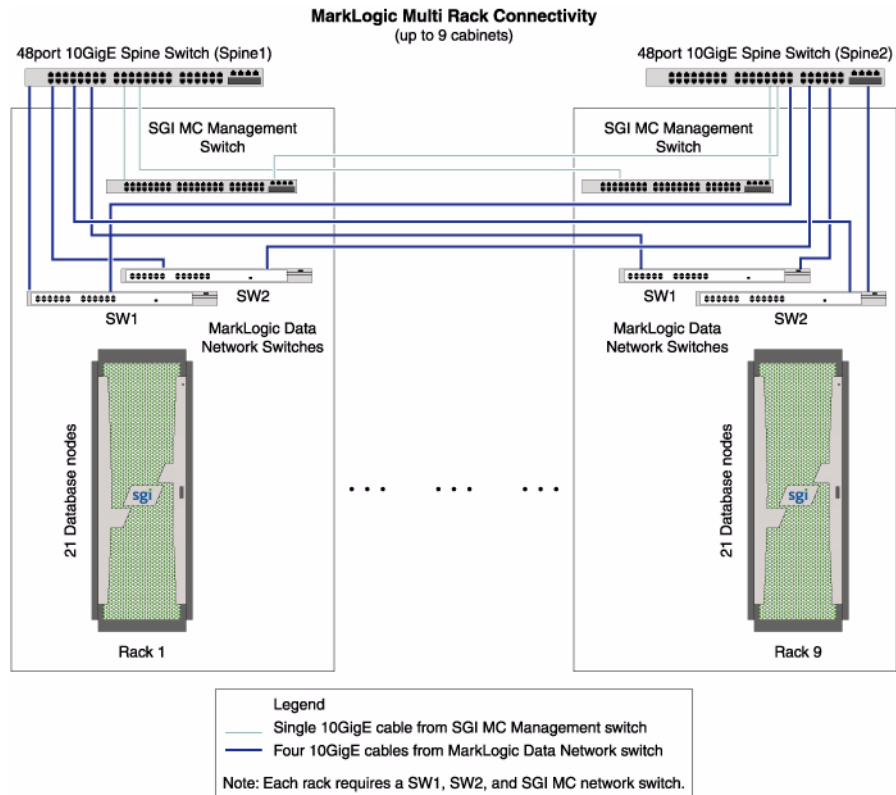
## Rack Level for Single-Rack Configuration

MarkLogic Rack Networking Layout



**Figure 1-12** Network Topology—Rack Level for Single Rack

## Inter-Rack Level



**Figure 1-13** Network Topology—Inter-Rack Level

## Software

The following components comprise the software stack for the SGI DataRaptor with MarkLogic Database appliance:

- Red Hat® Enterprise Linux (RHEL) 6.2 (2.6.32-220.el6.x86\_64)
- MarkLogic 6 Database v6.0-1.1
- SGI Management Center 1.6

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## Cluster Startup

This chapter describes the broad steps for starting the SGI DataRaptor appliance:

- “Configuring and Starting SGI Management Center” on page 17
- “Starting the Cluster for the First Time” on page 18
- “Re-Imaging the Server Nodes” on page 18

### Configuring and Starting SGI Management Center

To configure and start the SGI Management Center to monitor the DataRaptor appliance, you will need to follow the instructions in the *SGI Management Center Quick Start Guide* and appropriately configure the appliance servers described in [Table 2-1](#).

**Table 2-1** Hostnames for SGI Appliance Servers

Daemon	Management Network Hostname	Data Network Hostname
SGI Management Center	admin	
MarkLogic	r[rack#]n[node#]	r[rack#]n[node#]-bond0

## Starting the Cluster for the First Time

Use the following steps to start the cluster for the first time.

1. Power on the head node of the cluster.
2. Use SGI Management Center to start the nodes in the cluster.
  - a. Log in as `root`.
  - b. Start the SGI Management Center with the following command:  

```
# mgrclient
```

The default username/password for SGI Management Center is `root/root`.
  - c. Within the Management GUI, select the nodes to start, right-click, and select **Power > On**.

MarkLogic is configured to start once the servers have booted.
3. Use the web browser on the head node to log into the MarkLogic Administration web interface:  

```
http://r01n01:8001
```

The default username/password for the MarkLogic interface is `admin/admin`.
4. Verify that the cluster powered on correctly and that all slave nodes joined the cluster.

## Re-Imaging the Server Nodes

In SGI Management Center, there is a compute image for the MarkLogic compute nodes:

`Compute-MarkLogic`

Re-provision the nodes with the compute images as needed. Doing so will not impact the MarkLogic database on the system.

## MarkLogic Usage Notes

This chapter describes a couple of usage notes regarding the MarkLogic software:

- “MarkLogic License Installation” on page 19
- “MarkLogic Validation Database” on page 19
- “Additional Information on SGI Knowledgebase” on page 20

### MarkLogic License Installation

The SGI DataRaptor Appliance with MarkLogic Database comes preset with a permanent license key for the basic MarkLogic software. If you have purchased add-on features and do not yet have a license for those options, contact your SGI Sales representative.

### MarkLogic Validation Database

The SGI DataRaptor with MarkLogic Database appliance is factory-integrated with a small validation database that consists of one forest per host. The database name is `sgidb` and is provided as a cluster validation. Depending on your application requirements, you may need to create your own validation database. The validation database can be removed at any time but, once removed, it cannot be recreated without support from SGI.

To remove the `sgidb` validation database, run the following commands on node `r01n01` as root:

```
# curl --digest -u admin:admin http://localhost:8001/sgi/xqy/delete-xcc.xqy
# curl --digest -u admin:admin http://localhost:8001/sgi/xqy/delete-http.xqy
# curl --digest -u admin:admin http://localhost:8001/sgi/xqy/detach-forest.xqy
# curl --digest -u admin:admin
    http://localhost:8001/sgi/xqy/remove-replica-forest.xqy
# curl --digest -u admin:admin http://localhost:8001/sgi/xqy/delete-forest.xqy
```

```
# curl --digest -u admin:admin http://localhost:8001/sgi/xqy/delete-db.xqy
# curl --digest -u admin:admin http://localhost:8001/sgi/xqy/restart.xqy
```

Verify that the following events occurred:

- The `sgidb-http:10000` and `sgidb-xcc:10001` services have been removed.
- Database `sgidb` has been removed from the Database section.
- The `sgidb` forests have been removed from the Forest section.

## Additional Information on SGI Knowledgebase

You can find the customary SGI customer manuals on the SGI Technical Publications Library (See “[Related Publications](#)” on page viii.). You can find additional information about the SGI DataRaptor Appliance with MarkLogic Database on SGI Knowledgebase. This knowledgebase is a repository of support information including troubleshooting guides, how-tos, start-heres, and technical solution documents. The following are several usage notes about SGI Knowledgebase:

- SGI Knowledgebase requires an SGI Supportfolio user id and password. If you do not have such validation, go to [https://support.sgi.com/register\\_request](https://support.sgi.com/register_request).
- The URL for SGI Knowledgebase is <https://support.sgi.com/Knowledgebase>.
- SGI Knowledgebase has a conventional web search interface. You can find the desired documents by entering some combination of the following terms:
  - `dataraptor`
  - `marklogic`
  - `start here`